

'INTEGRAPH' MARVEL OF SCIENTIFIC AGE

DR. BUSH DEVELOPS MACHINE THAT IS ITS OWN THINKER

'Integraph' Will Automatically
Evaluate Very Complicated
Graphic Functions

SAVES MONTHS OF TIME

Four years of tedious research work by Dr. Vannevar Bush '16, professor of Electric Power Transmission, and a host of research assistants, have gone into the present make-up of an electrical machine which thinks for itself and mechanically grinds out the answer to problems far too difficult for solution by ordinary methods.

The new machine, which is called the Product Integrator, opens the doors to wider and more important fields of research hitherto superficially investigated. The present complex affair has been the result of much thought on the idea of supplying the need for computing machines into which may be introduced graphically the scientific relationships that are used extensively by engineers, and which will perform useful operations upon them directly, as curves. A description of the Integrator was printed in THE TECH some time ago, the present rising interest being due to the latest development in the machine.

Deals Directly With Functions

Engineers and physicists are depending increasingly upon mechanical devices as aids in computation, according to Dr. Bush, in a recently published paper on the machine, and this tendency is bound to grow as analysis is extended to problems of greater inherent complexity. Where the business world is ordinarily satisfied with addition, multiplication, subtraction and tabulation, the engineer has to use curves and graphs. Applied physics, electrical engineering and many other branches of science, frequently have to deal with functions as a whole, and usually resort to figures only as a rather laborious means of dealing with functions of the curves which represent them. Accordingly, a need has long been felt for computing machines which will employ directly the functions themselves. The present device is only an advanced step in the ultimate development of a compact apparatus capable of accomplishing all that can be done at present in addition to many more complicated processes.

Problems that would take several months to solve and many that cannot be solved without inaccurate assumptions, have been readily computed by the Integrator within a short period of ten minutes to a half an hour, and with an engineering accuracy of within two percent. In its present state, the entire apparatus completely covers a table three feet wide and 35 feet long, and for difficult problems requires from two to five assistants to operate the various pointers.

Records Result of Integration

All the mechanical integrators that have been developed so far usually evaluate the definite integral between fixed limits while the present Integrator is a multiplier and integrator which operates continuously, rather than point to point. This machine will plot the integral as a function of a variable upper limit. There are many physical and electrical problems involving computations of this sort, especially where the quantity under the integral sign is the product of two known functions; and the device which

ANNUAL DORM SMOKER TO BE HELD OCTOBER 27

A galaxy of vaudeville stars will furnish the entertainment for the annual dormitory smoker, which will be held next Thursday in the Carr Eastener Hall, according to George E. Francis, Jr., '28, who is chairman of the committee in charge.

Admission will be free to all dormitory men, and will be restricted to them and a few guests. Tickets for the affair will be placed in the mail boxes of dorm residents. Refreshments will be served, free smokes will be provided, and music will be provided by an orchestra.

Mystery of Masked Walker Is Solved

Walking with a deadly earnest demeanor, mask over nose and mouth, balloon-like cloth bag on back, a student promenading up and down the halls of Building 4 several days a week in the company of a pretty attendant has aroused considerable curiosity among those students whom necessity brings to the Institute between 8 and 9 o'clock mornings.

Investigation disclosed that this is merely part of the routine work being carried out by Professor Henry M. Smith of the Department of Chemistry as provided by the Ellen Richard Memorial Research Fund, the object being to determine the amount of energy consumed by the human body. Miss Katherine P. Salisbury, Holyoke '26, who is conducting the work, takes the subject out three times a week, collects the air he breathes and from analysis of this computes the energy expended.

President Gives Annual Report to The Corporation

Treasurer Also Reports—No Action Taken In Regard To Appointing Dean

At a meeting of the Corporation of the Institute held Wednesday, several items of routine business were disposed of, but no action was taken in regard to the appointment of a dean, it was announced. President Samuel W. Stratton delivered his annual report to the 25 members present, while the Treasurer's report was made by Henry A. Morris, the assistant treasurer, in the absence of Everett Morris, who was ill.

Making their annual report, the nominating committee made recommendations for the various committees of the Corporation, as well as for the officers for next year. These recommendations were adopted in their entirety. This committee was composed of Edwin S. Webster, chairman, Charles T. Main, and Salmon W. Wilder.

Munroe Re-elected Secretary

James Phinney Munroe was re-elected Secretary of the Corporation for another year, while Francis R. Hart was re-appointed to the Executive Committee for a five year term. In addition, appointments were made to the Committee on Finance, the Committee on Membership, the Auditing Committee, and the Committee on Nautical Museum. Visiting Committees for each of the departments of the Institute were chosen, seventeen in all. Before the adjournment of the meeting the following were chosen as Trustees of the Museum of Fine Arts: Samuel W. Stratton, President, William Emerson, Head of the Department of Architecture, and Edwin S. Webster, of the firm of Stone and Webster. The next meeting of the Corporation will probably be held in the first part of January.

CHEMICAL SOCIETY HOLDS FIRST SMOKER

Opening their activities for the year, the Technology Chemical Society held the first smoker of the season last evening in the North Hall, Walker. The feature of the program was a talk by Professor Henry M. Smith of the Department of Chemistry, who spoke on "Energy Expenditures During Physical Exercise."

Prof. Smith outlined the methods whereby, from analysis of the air breathed determinations may be made of the amounts of fat, carbohydrate and protein consumed by the subject, as well as the energy expended. The evening's program also included movies, supervised by the Colgate Manufacturing Co., dealing with the relation of soaps and fabrics, while levity was provided by one of the well-known Aesop's Fables comedies.

Mass Meeting of Freshman Class Is Called Today

Attendance Compulsory Since Field Day Plans Will Be Announced

Freshmen will hold a Field Day mass meeting in room 5-330 at 4:40 this afternoon. At this meeting plans for the Field Day melee will be discussed. The freshman class will be organized into a fighting group and all plans will be made for the extermination of the Sophomores. It is at this meeting that the freshmen will be told what to do and what not to do on Field Day.

Attendance at this meeting is compulsory for all freshmen. For this reason military drill will be terminated 20 minutes earlier than usual. In case of rain the meeting will be held at 4 o'clock and attendance for drill will be taken then. The probable speakers at the meeting are Assistant Dean Lobdell '17, O. B. Denison '11, Ralph Joje '28 and C. Brigham Allen '29.

DORMS HOLD DANCE TONIGHT IN WALKER

Initiating the social season of the dormitories, a Dorm Dance will be held tonight in the Main Hall, Walker Memorial, at 8 o'clock, with the Technicians playing for those who wish to indulge in the art of terpsichore. As is customary at the first Dorm Dance of the season, the affair will be informal and open to the entire student body. Mrs. James R. Jack and Mrs. Robert P. Bigelow will act as matrons, it was announced last night. Tickets will be on sale today in the Main Lobby from 12 o'clock until 2 at two dollars per couple.

CONVENTION CLOSES ITS TWO-DAY SESSION

Society of Sealers of Weights And Measures Adjourns

The Society of Sealers of Weights and Measures closed its annual convention in Room 5-330 Wednesday afternoon. This was the second day of the session and featured further discussion of various weighing and measuring devices, many of which were on display in the steam laboratory.

This year's meeting was held at the Institute upon the invitation of President Samuel W. Stratton, extended at the convention a year ago. The sessions were attended by the greatest number of Massachusetts standards experts yet assembled, more than one hundred being present at the opening session. This convention was opened by a talk by President Stratton on the recent adoptions of the International Bureau of Standards in regard to uniform physical constants, history of development of standards, and relation to the U. S. Bureau. President Stratton was himself Director of the United States Bureau of Standards before taking the President's Chair at the Institute.

SOPHOMORE TUTORIAL GROUPS BEGIN WORK

Variety of Subjects Chosen by Men in Honor Classes

Thirty-seven men have been accepted for the Sophomore tutorial English group. Of this number twelve elected to study music under Professor Roberts, twelve chose literature under Professor Rogers, six picked philosophy and the remaining seven have elected the fine arts. These last two groups are under Professor Seaver.

These men required to hold a half-hour conference every week with the professor in charge of their course. An amount of time equivalent to that of the regular E21 is required as outside work. This consists in reading and essay writing. The students in the fine arts group spend a good deal of their time in the various art galleries around Boston.

So many different subjects are chosen for specialization that it causes a considerable strain on the professor to keep ahead of his class, it is said. Subjects ranging from abnormal psychology to study of the ancient masters of Greece were some of the subjects in the philosophy group.

CARDINAL AND GRAY FAVORED TO WIN CROSS COUNTRY MEET WITH HOLY CROSS CRUSADERS

More Freshman Rules Blanks Now Ready

Those who have the success of the freshman rules at heart may now obtain enforcement blanks at the Information office. The initial supply of these soon ran out and for a short while none were to be had at all. However, 500 additional blanks have now been printed, and a continuous supply is insured for the future. Every student, whether freshman or upper-classman, is urged to make use of these blanks to aid the enforcement of these rules.

SENIORS TO HOLD DANCE AT ROGERS

Affair Will Be Free, But For Members of Graduating Class Only

At the meeting of the officers of the Senior class on Wednesday evening it was decided to hold a class dance at Rogers on the evening of November 11 from 9 until 1 o'clock. Permission has been secured from the authorities at Rogers for the use of the building and plans for the evening are now being worked out by the committee in charge.

Only members of the Class of 1928 will be admitted to the dance, which is formal and free. It is expected that several specialty acts will be secured for the event.

Gilbert J. Ackerman is chairman of the dance committee. Other Seniors assisting him are James Donovan, Ford W. Sammis, Edwin F. Celette, Arnold A. Archibald and Allen S. Richmond.

At the same meeting a committee of Seniors was appointed to interview jewelry companies in regard to the class rings. It is expected that the company will be chosen and the orders solicited before Christmas. Cyril B. Meagher is chairman of the ring committee and will be assisted by Robert Cook, A. Reginald Keith and Ralph T. Joje, president of the Senior Class, ex-officio.

PETROLEUM PICTURE SHOWN TO STUDENTS

Shows Story of Petroleum From Oil Well to Consumer

Before an audience of 300 students, the first of the movies on chemical industries was shown yesterday afternoon in room 10-250. This film traced the story of petroleum from the explorations of the geologist to the filling of the gas tank on the automobile.

One of the most spectacular features was that which showed the methods used in combating oil well and oil tank fires. The flaming oil is covered with Foamite or carbon tetrachloride, which smothers the fire. Another interesting point was the way in which the wax, the residue after everything else has been distilled off, can be molded while still hot. One picture showed a factory worker with the wax so entwined about her head that it appeared like a bridal veil.

The audience was afforded a hearty laugh by a freshman who unsuspectingly walked into the pitch black room and turned the lights on. As soon as he saw the spectators, he turned and fled with a frightened expression on his face.

Dr. Huntress of the Chemistry Department, who is in charge of the pictures, announced that the next movie, to be given two weeks from yesterday, will be "Oxygen, the Wonder Worker." This film will show the processes of manufacture of oxygen, liquid air, and acetylene.

RACE ON HARVARD COURSE TOMORROW WILL OPEN SEASON

Four Beaver Veterans of Last Year's Race Will Compete Against The Purple

FROSH ALSO ARE FAVORED

Two Holy Cross teams will invade Cambridge tomorrow morning when the Purple Varsity and freshman cross country teams will race against the Technology harriers over the Harvard course at 10:30. The Cardinal and Gray Varsity are heavy favorites to win and it would not be at all surprising for the frosh to nose out the Crusader yearlings also.

To equal the record of last year against Holy Cross, when all seven M. I. T. men finished before the first Purple runner, will be the object of every Cardinal and Gray harrier, but the figure of Fitzpatrick, captain of the Worcester team, stands in the way this year. In the meet with Harvard last Friday, in which Holy Cross was swamped by the score of 19 to 38, Fitzpatrick alone made a good showing for his team and battled with Jimmy Reid of the Crimson team right down to the finish, losing out by the narrow margin of five seconds.

The remainder of the Holy Cross team is mediocre. Beane, who is ranked next to his captain, finished ninth against Technology last year. Steppacker, Kiely, and Brennan, who finished one, two, three against the Technology yearlings last year have not shown much as Sophomores and none of them could finish better than eight against Harvard.

Four of the seven men who participated in the grand slam against Holy Cross last year are again competing for Technology: Capt. Pete Kirwin, Norm McClintock, Newell Mitchell,

(Continued on Page 3)

MARINE EXHIBIT ON VIEW IN BUILDING 5

Pictures of Ships Are Placed in Pratt Naval Museum

What promises to be one of the most interesting exhibits of the season that Technology will be privileged to view, is on exhibit at the present time in the Naval Architecture Museum, in the Pratt School of Naval Architecture.

This exhibit is composed of a collection of marine paintings which were painted by Mr. C. J. Wilson, of Newton, Mass. In the collection are included water colors, oil paintings, and sketches. The subjects are all ships, both sailing vessels and steamships. Ships which have become historical are in the group, which is remarkable not only because of the naturalness of the paintings, but also because of the adherence to minor details. The ships are shown with their complete rigging, and one can imagine them, just as they appear. Although Mr. Wilson was rather modest, it was discovered that he has spent the greater part of his life by the sea, thus showing the reason for his love of it.

The museum is open from 9 o'clock until 5 in the afternoon except on Saturday when it closes at 1. The exhibit will be on view for one month and all students are urged to drop in to building 5 during that time and look over the paintings.

CALENDAR

Friday, October 21
5:00—Freshman Mass Meeting.
5:00—Meeting of Boxing Candidates in Hangar Gym.
8:00—Dorm. Dance, Main Hall, Walker Memorial.
Monday, October 24
5:00—Swimming Mass Meeting in Room 1-190.
Tuesday, October 25
7:30—Tryouts for Tech Show cast in Show office, Walker.

**A Record of
Continuous
News Service
for 46 years**



**Official News
Organ of the
Undergraduates
of M. I. T.**

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Trailing tea wagons is by no means one of the favorite pastimes of the Lounger, especially after the scare he got when the proposed Tech-Hahvahd merger was uppermost in Institute scandal. That drove him wild; the thought of having henceforth to cultivate to the nth degree the art of balancing on the finger-tips a shell cup and saucer filled with the Crimson's established stimulant nearly made him kiss the world goodbye and hop into the Charlie, but that all passed over successfully, and the Lounger didn't have to get any wetter than usual.

But he was standing at the rail overlooking the Main Lobby, Monday afternoon, musing on the super-manliness of the Institute, when there suddenly came into view one of those peculiar Hahvahd delights—a heavily laden tea wagon, escorted down the hall by one of the Major's natty white wings. As soon as the Lounger could recover from the natural shock of seeing one of those atrocities in a hall of M. I. T., he fell into the procession of tea wagon and white wing fully determined to commit murder or what-have-you if only this curse could be eliminated.

The mystery lasted the entire length of building 4, through the qual labs, and down the halls of building 2 without even suggesting a solution. So the Lounger stepped up to the nursemaid behind the cart and worked out this explanation:

"Where does this grub go? Oh, the English bunch are giving a tea party for their wives and sweethearts—do it every year. Thank Gawd they let it go at that!"

The Lounger sounded forth a hearty Amen and beat a quick retreat. So the Mollie Pearson Pink Teas are to become an annual tradition, and for their wives and sweethearts! Can't you imagine Matty and the rest of the singletons having a gay old time? "Well," thought the Lounger, "let them have their pleasures—why murder the innocent—for they know not what they do."

As the Lounger passed Professor Drisko's private office, he just caught the last words of what resembled a pretty fair story. Can it be, the Lounger wondered, that the Faculty have been associating with the studes and been adding to their repertoire? Shame! But the worst blow of all came when instead of hearty masculine guffaws that the Lounger expected, there floated forth uncontrollable peals of feminine laughter that sounded as though the professor had for an audience the entire batch of Physics Department stenogs. Double shame!

But the spirit is right, for all the Lounger may gasp and blush in shame. Anyone knows these stenogs do enough for the Faculty to deserve just a little entertainment in return.

As We Like It

"GENTLEMEN PREFER BLONDES"

To be perfectly frank, we were rather disappointed last Tuesday night with the show which is now playing at the Majestic Theatre. Perhaps this was due to the fact that we had read the book (who has not?) and consequently expected great things of the play—or perhaps it was due to the fact that the night was mean and the house was not too demonstrative. At any rate, there was a decidedly noticeable lassitude in both the audience and the players. This was not made any better by the fact that the cast would persist in mouthing their lines—with a consequent loss of meaning of most of the play.

As a book, "Gentlemen Prefer Blondes" was excellent. As a play it is not so good, for there is not enough rapidity of action to keep up the interest. We felt that the authors have dragged in the best parts of the book for the sole reason of satisfying what might otherwise prove to be a disgruntled public. Then too, the whole thing seems to have been horribly purified to meet the demands of the Boston censors.

We are well aware of the fact that Lorelei Lee was a lady of more than easy virtue. If we are to judge her by the Boston presentation she is nothing more than a sweet and dumb little girl who seems to have a way with men. In consequence, she rather loses interest in our eyes.

Dorothy too, that marvelous, hard-boiled, wise-cracking creature, whose name will forever be a synonym for a clever and sophisticated woman, also suffers for some reason or another. Perhaps Edna Hibbard was bored by the house or by the weather—for her lines surely did not contain the snap and punch that a successful delineation of Dorothy should have.

The lesser comedy parts fared only

slightly better. As we remember, the ancient Mrs. Spoffard gave the best performance of them—but then, she did have some good lines and some clever situations. The two French lawyers, "Louie" and "Robber" were good and it was probably due to their efforts that the show contained the real humor of the book.

There was no denouement—or at least if there was, it was too cleverly hidden to be detected by the audience. The curtain came down rather suddenly on the third act, the lights went up and the house rather hastily consulted programmes to be certain that the thing was really over—somehow we all felt rather cheated as we filed out into the wet night.

A. P. M.

THE TECH BOOK LIST

A HELLUVA WAR, by Aurthur Guy Empey. New York: A. Appelton & Company. \$2.00.

One rarely finds a novel devoid of plot and romance and as highly interesting as "A Helluva War," by Arther Guy Empey. The author of this book has long ago taken honors in this field of writing when he presented to the war-story-readers "Over The Top" and other war novels.

Mr. Empey in his latest work successfully portrays an extremely interesting and humorous character. It

is without doubt purely a characterization of a red-blooded thick Irish-American, who has no use for any other unit of the Army besides the Cavalry. Luckily, he knows enough about his own unit not to call it a "Calvary." In the first hundred pages which are more interesting than one can imagine, the author, through a series of highly amusing incidents, introduces his character, Private Terrance X. O'Leary of the Cavalry, orderly to Colonel Tiernan of the Infantry. Our hero in the eyes of the Colonel had only four faults, he was a drunkard,

(Continued on Page 4)

Shh-h! The Young Lady



Whose back is toward you, has just told the young man that she will cancel a previous date any time he will take her to—

The Smartest Place to Dine and Dance in Boston

MUSIC BY LEO REISMAN

The New
EGYPTIAN ROOM
of 1927

AT HOTEL BRUNSWICK

FRESHMAN MILITARISTS HAVE BAND PRACTICE

THE old freshman uniforms are gone. With their passing the famous baggy pants, and misfit coats have been relegated to the forgotten limbo of old clothes. None mourn their passing, for people are not given to mourning for their old clothes—except such articles as inspire sentiment. No, the Sophomores, last year's freshmen, have not that affection for olive drab that a track star might have for his running pants, nor that a gallant Romeo might have for his lady-love's handkerchief.

So now Technology can boast of a freshman army that would do credit to any institution. To see a freshman walk down Charles River Road at the Page & Shaw lunch hour almost immediately gives rise to the feeling that the be-spurred cadet officers had better look to their laurels.

With the army outfitted on this new, and lavish scale, there remains but one thing to make them freshmanissimo of freshman—we refer to that most difficult phase of military education: teaching a recruit to distinguish between the left and right foot. Oh, it is not so easy! The day has gone when one can put hay in one shoe and straw in the other. Alas "Hayfoot—Strawfoot" belong to the all but forgotten past. The same is true of life and drum of the "Spirit of '76." But here is where the department has discovered another coup d'etat—it is the revival on a bigger and better scale of the band.

The turn out for practice has been fine, and in its augmented form the Band will soon make a debut. Here is a new addition to the factors which should help to stage a grand revival of Technology Spirit. The Band is not strictly a military attachment, but will be available for undergraduate assemblies, athletic events, Field Day, and all occasions when Bands are a desirable adjunct. If we can have a band at these events, there is no reason why we can't have singing. (A cue to the freshmen: get out your "bibles" and learn the Technology songs!)

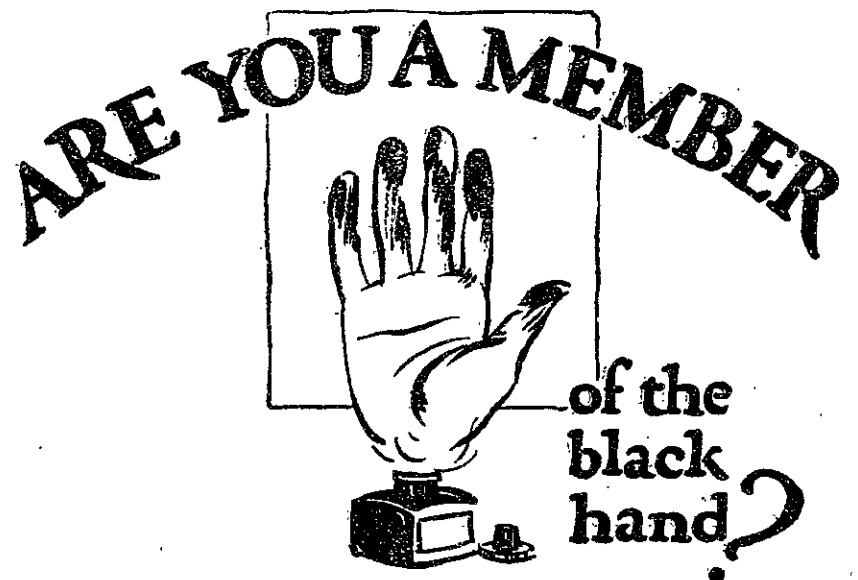
INSTITUTE DRAMATICS

EFFORTS to humanize undergraduate life and widen the scope of student activity are always to be welcomed here at Technology. Journalism, athletics, musical club work—all are far from the absolutely essential training of an engineer, yet without their broadening influence and the wealth of training and friendship they provide, a college graduate is totally unfitted for future success in the finer sense.

Hence we greet with enthusiasm the newest addition to Technology activities, the Dramatics organization. It is a sincere endeavor to add to the more or less "cold-blooded fact" atmosphere of the school, the warmer, personal touch that results from the study and presentation of stage masterpieces.

Through the performances of the selected plays undergraduates will be enabled to become familiar in a very intimate way with works of the best-known writers, with the added interest of seeing their Institute friends playing all the roles. They will be presented under the best of amateur direction, with Mr. Dean M. Fuller of the English Department and Mrs. King of the Walker Memorial Library, at the head of the coaching staff. That the students look with great favor upon this opportunity has been well shown by the fact that nearly every one of the numerous duplicate copies of each part were taken from the English Department office long before the preliminary trials were held.

Too much cannot be said for the pleasure and knowledge that result from the steady rehearsal of the various parts under efficient coaches and among willing aspirants to the several leads. No pastime can give more real enjoyment, in spite of the necessary intensive practice, and the satisfaction that results from a good performance may be realized only by one who has taken part in such an amateur production as will be presented in the Dramatics organization's first effort, Eugene O'Neill's "The Hairy Ape."



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WORCESTER IS FAVORED OVER ENGINEERS

COACH PICKS THREE MORE FROSH CREWS

In an attempt to give every freshman in the boathouse a chance to show his ability under actual rowing conditions, Coach Haines yesterday afternoon boated three more frosh crews and sent them down the river. In spite of the intermittent rain and overcast skies, he was fairly well pleased with the showing made by the beginners.

The two frosh boats that have been practicing in the mornings will be joined by the newly selected eight, beginning next week, so that the competition will reveal the comparative strength of the different outfits.



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Alpha: I'm all out; but you can't see my Higgins' Passions. I'll stick anything.

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Ad No. 6

Cardinal and Gray Soccer Team Improves on Defense But Offensive Is Still Weak

When Worcester Tech matches its skill with the Engineer soccer team tomorrow at Worcester, the former should have the edge over the Cardinal and Gray because of the fact that they have played more games and only lost to Northeastern by a 2 to 0 score. Technology has improved greatly since last Saturday as they have been practicing hard all week and are playing a much faster game.

Defensive work has been stressed for the past week and the teamwork has improved greatly. The weakest position has been the half backs, but they have improved considerably due to two stiff workouts in the middle of the week. The full backs have also been working hard trying to get everything that comes their way. Last Saturday it was noticed that they missed a number of shots that came right to them and the result was disastrous. As a whole the defensive teamwork is much better and they should put up a much better fight tomorrow than they did a week ago.

Passing and teamwork have been the principle details that the offense has been working on during the week. Last Saturday the game was marked by the lack of organized passing on the part of the offensive and Coach Welch has done a good deal to remedy this by two hard scrimmages which have greatly developed the team. In the game last week there was very little cross passing and tomorrow ought to see much better teamwork and passing attack than was evident last Saturday.

As last week was the first game of the season it is rather hard to predict the outcome of tomorrow's game. However, the teamwork and passing have improved greatly since last week. The men know each other's style better than they did last week and that is one of the necessities of a good soccer team. As their shots have improved considerably there is less likelihood that they will miss as many kicks as they did last Saturday.

Capt. Sparre leads the list of those who are sure to play tomorrow. Hawkins and Riehl will probably be found

at fullback, Mong, Sharabati, Fahey, and Baroudi will be forwards. The other positions have not been decided yet, but the following men will also accompany the team tomorrow: Wyman, Ventura, Delahanty, Bray, Devorss, Cooper, Kline, and Youngson. The team will meet at the track house promptly at 11:00 tomorrow morning and will go to Worcester by bus.

Events of Handicap Meet Held Tomorrow

120-yard low hurdles.
Pole vault.
Shot put.
Discus.
Javelin.
Hammer.
Running broad jump.
Running high jump.
70-yard dash.
200-yard dash.
400-yard run.
660-yard run.
1½-mile run.
Meet starts at 2:30.

BEAVER HARRIERS RULE FAVORITES

Engineer Hill and Dalers Are Expected to Crush Holy Cross

(Continued from Page 1)
and Chuck Worthen. The team is further strengthened with the addition of Leon Thorsen, a transfer who was ineligible last year, and Hal Dick and Red Walsh of last year's Varsity squad.

As far as competition is concerned, it is a question of how good Fitzpatrick will do, for it is a foregone conclusion that Technology will win. Capt. Pete Kirwin and Norm McClintock are running well enough now to capture the first two places for the Institute team. It is between Thorsen and the Holy Cross captain for third with the Purple harrier having the edge. Mitchell and Worthen are good enough to take the next two places and give Technology an approximate 18-38 victory.

Technology's yearling team has not been seen in competition, so it is hard to compare them with Holy Cross. However, Os Hedlund thinks he has a good squad and as the Purple team is not overly strong another Technology victory can be expected. There are rumors that Capt. Richard Baltzer of the Institute team is a coming star and on his form up to date he should lead the yearling runners. The other frosh starters will be Semple, Murphy, McSheehy, Goodhand, Allbright and Northrop. Several others will run without numbers.

UPSETS ARE FEATURE OF FALL TOURNAMENT

Kononoff and Cleary Display Fast Brand of Tennis

Thus far the annual fall tennis tournament has been featured by the playing of Kononoff and Cleary. Kononoff has shown his consistent style by winning his match with Miller 6-1, 6-3, while Cleary, a Sophomore, furnished a real upset by defeating Kuki, the fast captain of the Varsity team.

This year's tournament has been much more successful to date than those of previous years both in the spirit shown by the men and by the number taking part. One hundred and seven men signed up for the tournament this year, this being the largest number that ever took part in a tournament at the Institute.

Due to the inclement weather the date for the finish of the second round of the tournament has been postponed until 9 a. m. Monday, October 24. Those who have not played off their second round matches by that time will be defaulted automatically.

Engineers Who Race Against Holy Cross

P. H. KIRWIN '28 (Capt.)
H. G. DICK '28
N. L. MCCLINTOCK '29
N. W. MITCHELL '29
L. S. THORSEN '30
R. E. WALSH, JR., '28
C. E. WORTHEN, JR., '29

SOPHOMORE ELEVEN BATTLES LAWRENCE

Fast Scrimmage With Beavers Primes Team for Game

Scrimmage with the Beaver team of last year on Wednesday afternoon was not enough to enable Coach Joe Parks to pick a team for Saturday's game. Consequently the whole squad will make the trip Saturday when the team opens with Lawrence Academy at Groton.

After a week of rain, Wednesday's fair weather brought a welcome opportunity for some real practice. The scrimmage showed some of the best put on so far this season.

Particularly noticeable was the way the team rose to the occasion and held the Beavers near the goal line. After the walkaway by the Beavers in mid-field the Sophs held hard on the ten-yard line. Eight downs were needed by the Beavers in putting the ball across that last stretch.

On the offensive the plays went off with a nice degree of smoothness, the team working well together. The way the line held the Beavers showed what the defensive could do. Defense against a passing game seems to go off well, many of the passes being nicely spoiled.

All the men out Wednesday were put into the scrimmage. Because there was no outstanding team the whole squad of over a team and a half will go to Groton on the bus leaving the field at eleven thirty.

YEARLING GRIDSTERS TAKE ON B. U. FROSH

For their second game of the season the frosh gridmen will take on the first year outfit from Boston University. This is the team's first home game and will be played here on Tech Field Saturday afternoon.

Since the game last Saturday at New Bedford the yearlings have had very little chance to practice. The first two afternoons of the week were not fit for practice because of the weather. Wednesday the team was only able to get in a little signal practice after dark because of the Sophomore scrimmage. Mud on Thursday prevented any hard workout.

No question of lineup is brought up with the frosh squad. The men are so few in number that they all are needed in the course of the game. About the same lineup will go into the game as started the game at New Bedford. B. U. has had several games this season but in spite of this advantage in experience the Institute frosh have high hopes of winning.

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WHY WAIT FOR SUNDAY MORNING FOR NEWS OF THE OUTCOME OF THE FOOTBALL CONTESTS?

The Boston Transcript Football Extra

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SATURDAY, OCTOBER 22

Containing Complete Stories of the Principal Games Will Be on Sale at the News Stands in Your Town The Same Day the Games Are Played.

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of the

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Stories and Scores of the
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BROWN-LEBANON VALLEY
ANNAPOLIS-DUKE

HOLY CROSS-CATHOLIC UNIVERSITY
TUFTS-VERMONT
BOSTON UNIVERSITY-SPRINGFIELD
GAMES

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Jordan Marsh Company THE STORE FOR MEN A Separate Store in a Separate Building Jordan Marsh Company

Special purchase and sale!

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Superbly tailored of fine Scotch and Irish fleeces—warm and comfortable in any weather—distinctive in appearance—at the lowest price we can remember—these coats having been sold for in Boston.

THE TECH BOOK LIST

(Continued from page 2)

found no use for the English, was a former cavalry man, and was the greatest liar known in the Army; however, he had his good point, he was extremely brave (trebly, with a few drinks). O'Leary had the reputation of being able to find a drink of Johnnie Walker in the Sahara.

In the latter part of the book the author seems to be working on the sympathies of the reader, for every time our hero does a courageous deed, he lies himself out of it, is found in an intoxicated state or does a doubly dishonorable act that hardly cancels all the good he had done. At any rate it is to the writer's credit when he is able to effectively work on the emotions of the reader.

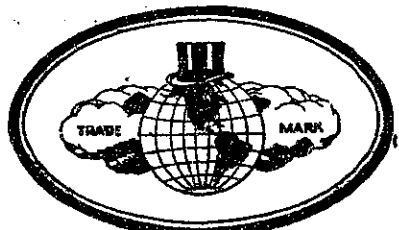
Although "A Helluva War" is not a book that will make a deep impression on those exposed to it, it is a cleverly written story, highly amusing and extremely entertaining. What more could a casual reader desire? E. L. W.

CORPORATION XV TO MEET NEXT MONDAY

Corporation XV will hold its first regular meeting in the Combined Professional Societies room on the third floor of building 3, on Monday afternoon at 4 o'clock. This meeting is open to anyone who wishes to attend, but the Juniors and Sophomores are especially urged to attend. Within the next few weeks, the election for Junior Directors of the Corporation will be held and all Juniors and Sophomores are eligible for these positions.

During the next few weeks Corporation XV will carry on a drive for new members. Admission to the Corporation is not restricted, but is open to all students at the Institute. There will not be any specified days for the drive but it will extend throughout the next few weeks, until a sufficient number of students have joined the Corporation.

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INTEGRAPH IS NEW MARVEL OF SCIENCE

Automatic Calculating Machine Developed by M. I. T. Professor

(Continued from Page 1)

derives its name from the fact that it records the result of an integration in the form of a plot or graph, accomplishes this difficult feat easily and directly.

The machine itself is conveniently divided into three sections. They are the integrating devices, the means by which results are conveniently recorded, and mechanisms by which the variables are introduced into the integrating devices. In addition to these necessary elements of the machine, certain mechanical features are employed to improve the actual operation and accuracy.

Sum Plotted as a Curve

A modified Thompson Direct Current Integrating Watthour Meter performs the initial stage of integration. This piece of apparatus has been so adjusted that the speed of the armature is proportional to the torque on it. In this device, all the infinitesimal products of the variables, flux and current, are added up and the sum plotted as a curve. The second stage of the integration occurs in a Kelvin Integrating Wheel which is incorporated in the watthour meter.

Important types of first and second order differential equations have been solved very easily by the Integragraph. When the machine is used for integrating two functions, two operators are necessary, one for following each curve with a pointer. On five platens in the form of drawing boards, with large sized graph paper, the graphs of the separate functions are drawn to scale. Guided by these curves, an index on a potentiometer slide wire follows the curvature, and causes a potential difference in the watthour meter that is proportional to the ordinates of the curve. The watthour meter, in turn, controls a motor through several relays which drives a pencil on another platen covered with a piece of graph paper. The final result is traced on this sheet in the shape of a curve from which is obtained the desired solutions. This is done by running a known problem through the machine and getting a calibration plot to which the other solutions can be compared.

Solves Second Order Equations

When a second order differential equation is in the meshes of the Integragraph, a second integrating device must be used which performs approximately the same type of operation as the first. This integrates the result a second time. The machine is now only capable of solving first order and second order differentials but with additional devices and complicated mechanical circuits, the Integragraph may be made to grind out solutions to equations of any order, provided they can be put into an integrable form. In a more compact and usable arrangement, this device will prove to be a great boon to science, it is believed.

ANNOUNCE TECHNIQUE ELECTIONS TO BOARD

Results of the competition for positions on the Junior Board of *Technique* were announced yesterday. Howard G. Pankratz '29 was elected to the position of Photographic Manager; Robert S. Riley '29 was elected to the position of Departments Editor, and Richard J. Coveney '29 will fill the position of Features Editor.

This competition was initiated by the Institute's annual at the beginning of the term as a result of vacancies in the Junior Board, and lasted until last Saturday. Elections were held Wednesday. It was also announced by *Technique* that very few appointments for sittings for Senior Portfolio pictures have been made, and the year-book requests that they be made as soon as possible. For the convenience of Seniors, they may be made in the Main Lobby daily between 12 o'clock and 2.

RADIO CLUB HEARS INTERESTING TALK

An address by Mr. Frank G. Kear, Research Assistant in the Electrical Engineering Department, was the chief feature of the Radio Society meeting on Thursday afternoon. Mr. Kear, who is connected with the communications option work, chose as his subject, "Radio and Radio Clubs." In this talk he gave those present a good idea of what the aims of a Radio Club should be, and what it should accomplish, both as a club and through its individual members.

Following Mr. Kear's address, an open discussion was held, in which various subjects were touched upon, principally new methods of transmission, and new types of equipment.

It was announced that the proposed schedule of operators was being formulated, and that the station would soon be working in earnest. The station has been assigned a new call, 1-BXM, which it will use for all transmission of messages.

CAN STILL GIVE TO T.C.A. IN MAIN LOBBY

\$74.80 in Additional Cash and Pledges Already Taken

Upon the failure of the T. C. A. drive a box was placed in the Main Lobby for the benefit of those who wanted to contribute to the drive, but who for some reason or other were unable to do so at the time. This box was removed the other day and found to contain \$74.80 in cash and pledges. It will be placed in the Main Lobby again today in order that any who still desire to raise the amount of their contribution may do so. So far a total of \$1,200 in cash and \$800 in pledges has been turned in to the T. C. A. office, and pledges amounting to \$74.80 have been redeemed.

T. Carlton Kane '28 who is in charge of the T. C. A. undergraduate solicitation and receipts is sorting the pledges and will have reminders sent to those living in the dormitories or outside. Those men who live in fraternity houses will not receive the reminder but will be expected to redeem their pledge through the man in charge of the solicitation in the house.

FRESHMEN COXSWAINS

All freshmen under 125 lbs who wish to become coxswains should report to Coach Underwood at the boat-house any afternoon this week.

FRESHMAN ATHLETICS

Members of the Freshmen Class who wish to substitute athletics for Physical Training Classes must sign up at once in Room 335, Walker Memorial Bldg. These lists close on Wednesday, October 26th, at 12 o'clock.

Notices and Announcements

MEN WANTED FOR DEPARTMENT STORE

Work, Saturday, Oct. 29, Nov. 5; Friday, Nov. 11, and Saturday, Nov. 12. Employer will not consider any man unless he can give all the days listed.

If interested call at the Undergraduate Employment Bureau, Wednesday, 9:30 a. m. to 4:30 p. m., and Thursday, 9:30 a. m. to 12 noon.

FRESHMAN RIFLE TEAM

A freshman rifle team is being formed. All members of 1931, who are interested in rifle shooting should go to Room 3-305 and furnish the information called for on the bulletin board.

SWIMMING

All freshmen and varsity candidates for the swimming teams are urged to be present at the mass meeting to be held in Room 1-190 at 5 p. m. on Monday, October 24.

TECH SHOW TRYOUTS

Tryouts for the cast of Tech Show 1928 will be held on Tuesday evening at 7:30 o'clock in the Tech Show office. All those who signed up for the cast are requested to be there, and any others who wish to try out for the cast are also asked to come.

CORPORATION XV

Corporation XV will hold a meeting in the Combined Professional Societies room on Monday afternoon at 4 o'clock. The meeting is open to all, but Juniors and Sophomores are especially urged to attend.

NOTICE

There will be a meeting of all interested in writing music and lyrics for the Tech Show, Wednesday night at 7:30 o'clock, in the East Lounge, Walker.

SENIORS

Make appointments for Portfolio pictures in the Main Lobby between 12 and 2 o'clock.

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